

Attorney Docket No. P09594-US2

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions and listings of claims in the application.

Listing of Claims

1-111. (Canceled)

112. (New) A communication device for generating and transmitting data packets having a first data structure determined by a first protocol, said communication device comprising:

means for receiving data packets having a second data structure determined by a second protocol;

means for discriminating between a first type and a second type of received data packets by accessing a predetermined field in the received data packets in which the type of data packet is indicated;

means for generating data packets having the first data structure by embedding the data packets having the second data structure in at least one of the data packets having the first data structure; and

transmission means for transmitting the generated data packets to a receiving entity, said transmission means including in each of the transmitted data packets, an indication of the type of data packet.

113. (New) The communication device of claim 112, wherein the first protocol is at a first layer in a protocol suite, and the second protocol is at a second, higher layer in the protocol suite.

114. (New) The communication device of claim 113, wherein the first layer is higher than a third layer in the protocol suite, and the transmission means transmits the generated data packets to a receiving entity in the third layer of the protocol suite.

Attorney Docket No. P09594-US2

115. (New) The communication device of claim 113, wherein the first protocol is a transmission protocol, and the transmission means transmits the generated data packets to a receiving entity over a communication link.

116. (New) The communication device of claim 115, wherein the transmission means utilizes a first transmission reliability mode for transmitting data packets having the first type of data packets embedded therein, and utilizes a second transmission reliability mode for transmitting data packets having the second type of data packets embedded therein.

117. (New) The communication device of claim 112, wherein the means for discriminating between a first type and a second type of received data packets accesses a field in each received data packet that indicates the contents of the received packet, and discriminates between the first and second types of received data packets in accordance with the contents of each received data packet.

118. (New) The communication device of claim 112, wherein the means for discriminating between a first type and a second type of received data packets accesses a field in each received data packet that indicates a transmission protocol to be utilized to transmit the received packet, and discriminates between the first and second types of received data packets in accordance with the indicated transmission protocol.

119. (New) The communication device of claim 118, wherein the transmission means includes means for associating each indicated transmission protocol with a transmission reliability mode.

Attorney Docket No. P09594-US2

120. (New) A communication device for generating data packets having a first data structure determined by a first protocol, said communication device comprising:

means for receiving data packets having a second data structure determined by a second protocol;

means for discriminating between a first type and a second type of received data packets according to predetermined rules based on the contents of the received data packets;

means for generating data packets having the first data structure by embedding the data packets having the second data structure in at least one of the data packets having the first data structure; and

means responsive to the discriminating means, for adjusting an operation mode to match the type of received data packet, wherein the operation mode is associated with one or more of automatic repeat request error recovery, forward error correction, transmission quality, quality of service, transmission priority, and security.

121. (New) The communication device of claim 120, wherein the means for adjusting the operation mode is adapted to adjust a forward error correction mode that includes one or more of frame check sequence based error detection, forward error control based error correction, interleaving-based error prevention, power control, spreading-based error prevention, frame length control, and bandwidth reservation control.

122. (New) The communication device of claim 120, wherein the data packets of the second structure carry quality requests, and the discriminating means is adapted to discriminate between the data packets of the second data structure on the basis of the quality requests.

123. (New) The communication device of claim 122, wherein the means for adjusting the operation mode is adapted to adjust one or more of a transmission quality, transmission priority, and quality of service for at least one of the data packets of the first data structure on the basis of a discriminated quality request.

Attorney Docket No. P09594-US2

124. (New) The communication device of claim 120, wherein the means for adjusting the operation mode is adapted to adjust the operation mode to be compliant with requirements of a communication link over which the data packets of the first structure are to be sent.

125. (New) The communication device of claim 120, further comprising an output buffer having a plurality of separate queues for storing the data packets of the first data structure, wherein each separate queue is associated with one of a plurality of predetermined operation modes, wherein the means for adjusting the operation mode is adapted to select an operation mode for each of the data packets of the first data structure from among the plurality of predetermined modes, and to place each of the data packets of the first data structure into an associated queue in the output buffer.

126. (New) The communication device of claim 125, wherein the separate queues are associated with a predetermined priority order with respect to a transfer of the data packets of the first data structure.

127. (New) The communication device of claim 126, wherein a first queue is associated with a numbered mode and a second queue is associated with an unnumbered mode, and data packets stored in the first queue that are to be retransmitted receive a higher transmission priority than data packets stored in the second queue.

128. (New) The communication device of claim 120, wherein the contents of the data packets of the second data structure form a hierarchy, and the discriminating means includes:

means for determining identification information for a given data packet of the second data structure;

means for comparing the identification information with stored rules that allocate a predetermined operation mode to predetermined identification information;

Attorney Docket No. P09594-US2

means for setting the operation mode for the given data packet in accordance with a determined allocation, if the identification information is among the stored rules; and

means for determining in the contents of the given data packet, higher level identification information associated with a next level in the hierarchy and then comparing the identification information of the next level with the stored rules, if the identification information is not among the stored rules;

wherein the discriminating means continues to determine identification information at sequentially higher levels in the given data packet and to compare the identification information with the stored rules until either the identification information is among the stored rules and the operation mode for the given data packet is set in accordance with a determined allocation, or a fail-safe condition is met and a default operation mode for the given data packet is set.

129. (New) The communication device of claim 120, wherein the first protocol specifies performing segmentation in order to embed the data packets of the second data structure in the data packets of the first structure.

130. (New) The communication device of claim 129, wherein the discriminating means also includes means for detecting a packet delimiter belonging to a data packet of the second data structure in data packets of the second data structure that are to be embedded, and to duplicate the packet delimiter prior to embedding.

131. (New) The communication device of claim 129, wherein the first protocol is a protocol for sending data packets over a link, and a retransmission of data packets belonging to a first transmission reliability mode is decided based on acknowledgment data packets for data packets already sent over the link, and the device further comprises an output buffer adapted to transmit data packets belonging to a second transmission reliability mode only if the receipt of all previously sent data packets of the first transmission reliability mode has been acknowledged.

Attorney Docket No. P09594-US2

132. (New) The communication device of claim 129, further comprising a receiving buffer for receiving data packets of the first structure over a link, said receiving buffer comprising:

a first part associated with a first transmission reliability mode for storing data packets sent in accordance with the first transmission reliability mode; and

a second part associated with a second transmission reliability mode for storing data packets sent in accordance with the second transmission reliability mode.

133. (New) The communication device of claim 132, wherein data packets sent in accordance with the first transmission reliability mode are numbered to specify a correct order, and the receiving buffer is adapted to detect in received data packets, a packet delimiter belonging to the data packet of the second data structure embedded in the received data packet of the first data structure sent in accordance with the first transmission reliability mode.

134. (New) The communication device of claim 133, wherein the receiving buffer is further adapted to store the received data packets of the first data structure until either a complete data packet of the second data structure has been received, which is determined by the receipt of the packet delimiters belonging to the data packets of the second data structure, or, for the data packets of the first data structure belonging to the second transmission reliability mode, a predetermined buffer limit is exceeded.

135. (New) The communication device of claim 120, wherein the means for adjusting the operation mode includes means for selecting a transmission mode from among at least a reliable transmission mode, an unreliable transmission mode, and a semi-reliable transmission mode.

Attorney Docket No. P09594-US2

136. (New) In a communication device, a protocol implementation of a first protocol layer, said first protocol layer being arranged to receive data packets of a second protocol layer that lies above the first protocol layer and to embed each of the data packets of the second protocol layer into one or more data packets of the first protocol layer, said protocol implementation of the first protocol layer furthermore being arranged to dynamically adjust an operation mode for transmitting the data packets of the first protocol layer on the basis of transmission quality requirements provided by a peer of a protocol layer lying higher than the first protocol layer.

137. (New) In a communication device, a method of generating and transmitting data packets having a first data structure determined by a first protocol, said method comprising the steps of:

- receiving data packets having a second data structure determined by a second protocol;

- discriminating between a first type and a second type of received data packets by accessing a predetermined field in the received data packets in which the type of data packet is indicated;

- generating data packets having the first data structure by embedding the data packets having the second data structure in at least one of the data packets having the first data structure; and

- transmitting the generated data packets to a receiving entity, wherein each of the transmitted data packets includes an indication of the type of data packet.

138. (New) In a communication device, a method of generating data packets having a first data structure determined by a first protocol, said method comprising the steps of:

- receiving data packets having a second data structure determined by a second protocol;

- discriminating between a first type and a second type of received data packets according to predetermined rules based on the contents of the received data packets;

Attorney Docket No. P09594-US2

generating data packets having the first data structure by embedding the data packets having the second data structure in at least one of the data packets having the first data structure; and

adjusting an operation mode to match the type of received data packet, wherein the operation mode is associated with one or more of automatic repeat request error recovery, forward error correction, transmission quality, quality of service, transmission priority, and security.

139. (New) The method of claim 138, wherein the step of adjusting the operation mode includes adjusting a forward error correction mode that includes one or more of frame check sequence based error detection, forward error control based error correction, interleaving-based error prevention, power control, spreading-based error prevention, frame length control, and bandwidth reservation control.

140. (New) The method of claim 138, wherein the data packets of the second structure carry quality requests, and the discriminating step includes discriminating between the data packets of the second data structure on the basis of the quality requests.

141. (New) The method of claim 140, wherein the step of adjusting the operation mode includes adjusting one or more of a transmission quality, transmission priority, and quality of service for at least one of the data packets of the first data structure on the basis of a discriminated quality request.

142. (New) The method of claim 138, wherein the step of adjusting the operation mode includes adjusting the operation mode to be compliant with requirements of a communication link over which the data packets of the first structure are to be sent.

Attorney Docket No. P09594-US2

143. (New) The method of claim 138, further comprising the steps of:
selecting an operation mode for each of the data packets of the first data structure from among a plurality of predetermined modes; and
placing each of the data packets of the first data structure into an associated queue in an output buffer having a plurality of separate queues associated with the plurality of predetermined operation modes.

144. (New) The method of claim 143, wherein the separate queues are associated with a predetermined priority order with respect to a transfer of the data packets of the first data structure.

145. (New) The method of claim 144, wherein a first queue is associated with a numbered mode in which data packets are retransmitted, and a second queue is associated with an unnumbered mode, and the method further comprises transmitting data packets stored in the first queue with a higher transmission priority than data packets stored in the second queue.

146. (New) The method of claim 138, wherein the contents of the data packets of the second data structure form a hierarchy, and the discriminating step includes the steps of:

determining identification information for a given data packet of the second data structure;

comparing the identification information with stored rules that allocate a predetermined operation mode to predetermined identification information;

setting the operation mode for the given data packet in accordance with a determined allocation, if the identification information is among the stored rules; and

determining from the contents of the given data packet, higher level identification information associated with a next level in the hierarchy and then comparing the identification information of the next level with the stored rules, if the identification information is not among the stored rules;

Attorney Docket No. P09594-US2

wherein the method continues to determine identification information at sequentially higher levels in the given data packet and to compare the identification information with the stored rules until either the identification information is among the stored rules and the operation mode for the given data packet is set in accordance with a determined allocation, or a fail-safe condition is met and a default operation mode for the given data packet is set.

147. (New) The method of claim 138, wherein the step of generating data packets includes segmenting the data packets in accordance with the first protocol in order to embed the data packets of the second data structure in the data packets of the first structure.

148. (New) The method of claim 147, wherein the discriminating step also includes detecting a packet delimiter belonging to a data packet of the second data structure in data packets of the second data structure that are to be embedded, and the generating step includes duplicating the packet delimiter prior to embedding.

149. (New) The method of claim 147, wherein the first protocol is a protocol for sending data packets over a link, and the method further comprises the steps of:

retransmitting data packets belonging to a first transmission reliability mode based on acknowledgment data packets for data packets already sent over the link; and
transmitting data packets belonging to a second transmission reliability mode only if the receipt of all previously sent data packets of the first transmission reliability mode has been acknowledged.

150. (New) The method of claim 147, further comprising the steps of:
receiving by a receiving buffer, data packets of the first structure over a link;
storing data packets sent in accordance with the first transmission reliability mode in a first part of the receiving buffer; and
storing data packets sent in accordance with the second transmission reliability mode in a second part of the receiving buffer.

Attorney Docket No. P09594-US2

151. (New) The method of claim 150, further comprising the steps of:
numbering data packets sent in accordance with the first transmission reliability mode to specify a correct order; and

the receiving buffer detecting in received data packets, a packet delimiter belonging to the data packet of the second data structure embedded in the received data packet of the first data structure sent in accordance with the first transmission reliability mode.

152. (New) The method of claim 151, further comprising storing in the receiving buffer, the received data packets of the first data structure until either a complete data packet of the second data structure has been received, which is determined by the receipt of the packet delimiters belonging to the data packets of the second data structure, or, for the data packets of the first data structure belonging to the second transmission reliability mode, a predetermined buffer limit is exceeded.

153. (New) The method of claim 138, wherein the step of adjusting the operation mode includes selecting a transmission mode from among at least a reliable transmission mode, an unreliable transmission mode, and a semi-reliable transmission mode.